

ABSTRACT OF DISCLOSURE

Disclosed is a capillary mixer for mixing first and second reactant solutions to form a mixed solution prior to delivering the mixed solution to an ion source of a mass spectrometer. The mixer comprises: a pair of concentric capillaries consisting of: an outer capillary connected at a distal end to an inlet of the ion source and being connected at a proximal end to a source of the second reactant solution; and an inner capillary within the outer capillary, thereby forming an annular intercapillary space between the outer and inner capillaries, wherein: the inner capillary is connected at a proximal end to a source of the first reactant solution and has an opening at or near a distal end, is slidably sealed to the outer capillary at or near the proximal end of the outer capillary and is movable back and forth within the outer capillary, whereby the first reactant solution is delivered through the inner capillary and the second solution is delivered through the intercapillary space; and the first and second reactant solutions get mixed to form the mixed solution in a mixing region within the intercapillary space into which the first reactant solution is expelled through the opening. Because the inner capillary is movable, the reaction chamber volume is adjustable. As a result, both spectral and kinetic modes of operation can be conducted by using the same mixer.